RÖNTGENOTHERAPY AND THE NURSE

By LOUISE D'ARBY, R.N.
New York, N. Y.

Since the discovery, twenty-two years ago, of the Röntgen ray, commonly called "X" because of its invisibility, it has been demonstrated and proven by observation and many tests, that x-rays have a curative influence in disease by inhibition of diseased cells and consequent destruction, absorption and elimination. Sufficient time has not elapsed to prove a positive cure in cases of malignancy, but we do know that the percentage of recurrencies is definitely decreased in cases of post-operative röntgenotherapy.

The röntgenologist should always be the person to prescribe the dose of x-rays, in the same manner that the internist prescribes a course of medicine for his patient and, although the nurse or the technician may be able to carry out his orders to perfection, no one but a "degree-d" röntgenologist should attempt to prescribe for a patient or to make a diagnosis, as far as the x-ray is concerned.

The x-ray tube gives off hard and soft rays which are "X" and secondary in character. Sometimes the rays are designated as "deep" and "superficial" instead of "hard" and "soft." It is the deep, penetrating "X" ray which is the curative element in deep-seated disease, as of the internal organs in cases of carcinoma, etc., while it is the softer rays which are used for epithelioma and skin diseases. The secondary rays are always given off whenever a tube is in action.

In deep therapy there is sufficient current sent into the tube to reach the deepest diseased cells, according to the dose and, consequently, there are many soft rays emitted at the same time which would be sufficient to cause severe burning of the skin and somtimes destruction of the underlying tissues. To avoid this, filters of aluminum and sole leather, varying in thickness from 1 mm. to 4 mm. each, are used. These filters, or screens, will arrest the soft or superficial rays, which would otherwise strike the patient, and only the deep, penetrating rays are allowed to strike the point exposed. This is a very important part of the prescription and it should never be omitted. Röntgenologists have preferences for machines, tubes, dosages, etc.; no attempt will be made to describe any of them, except to mention one or two of the more common tests for measuring x-ray, when given in therapeutic doses, with which the nurse is usually familiar:

Keinboch's method, taken from Tousey: The apparatus used employs little slips of not very sensitive bromid paper of a standard make. One of these is wrapped in black paper and exposed at the same time and distance as the patient; then placed in a developing solution of standard strength for a standard time (one minute) inside a little portable dark room. The developed paper is at once compared with the scale of different shades of paper. The number marked on the shade which the test paper matches indicates the number of Keinboch units applied. Each unit is called "X."

The Sabouraud and Noire radiometer: This is a little tablet or pastille covered with barium platino-cyanid; it is exposed at half the distance from the anticathode to the surface to be treated during the x-ray application. Different shades of the pastille correspond to different doses.

Treatment of diseased tissue by means of x-rays is now being used not only in cases where operation is impossible, but is employed in a large number of post-operative cases of malignant as well as benign growths. It is impossible for the surgeon to resect all diseased tissue, that is to get every cell, and therein lies the danger of recurrency; in reasonably sure cases it is used as a prophylactic measure. If there is a diseased cell, the x-ray will attack it and destroy it and it is finally absorbed and carried away.

Experiments show that while the x-ray has no effect upon tubercle bacilli when cultured, it has been reported successful as a cure for tubercular ulcers on the surface of the body. Also, in cases of tubercular glands, it has been known to cause the disappearance entirely of the swelling, which is to be preferred to surgical measures. Tuberculous areas of the peritoneum and of the kidney as well as pulmonary tuberculosis and infections of the joints and bones, have all shown marked improvement from x-ray treatment. It has also been used with equal success in cases of trachoma, locomotor ataxia, dysmenorrhea and neuralgia.

Röntgenotherapy, by producing an atrophy of the more highly specialized elements of the skin, has done much toward improving and curing diseases of the skin, such as acne, favus, sycosis, psoriasis, etc. In the treatment of lipoma and keloid many successful cases have been reported. Some cases of syphilitic gumma and leprosy have shown remarkable changes under the x-ray.

In treating a case, no matter what it is, there are certain technical points for the nurse, technician or attendant to remember:

First, Preparation and protection of the patient. It is always well to have the area to be treated exposed; this is not necessary and in

some cases, such as broken down carcinoma, etc., it is better to leave the bandages or dressings on; but these directions are based on the supposition that the skin is still intact. Place the patient on the table or in the chair, wherever he is to be treated. Let the patient adjust himself as comfortably as possible; the tendency to want to move is thus lessened. This position, of course, should be adjusted so that the area can be reached by the rays emitted from the tube. Most doctors mark off the areas to be treated, while others gauge by the circle of light from the illumined tube and gently tap the skin here and there to show the areas. This is usually done with an indelible pencil dipped in water. Never overlap an area; it is perfectly proper and always right for a nurse to call the attention of the operator if there is the least suggestion of an overlapping. The anodal-skin distance should always be measured vertically from the highest point of skin in the area to the center of the tube. Protection of all other areas of the body from the secondary rays which are emitted in all directions from the tube is a great prophylactic measure. This protection is provided by means of lead-rubber sheets, large enough to cover up the rest of the body. In addition to this, directly over the area should be put the prescribed amount of sole leather and in the slot in the tube-stand the prescribed amount of aluminum. Thereby the patient is protected from secondary rays and from extra soft rays which are not needed and measured by the required depth of the treatment. Arms, legs, etc., should be fixed with sandbags, if there is any danger of the patient moving the area under the tube, thereby causing an overlapping and maybe a burn as the result. As a matter of extra precaution, it is well to cover the patient's head with lead-rubber, for it is the tendency of the secondary rays to strike the hair and cause that feeling known as "rising." This often alarms the patient, but the lead-rubber protection overcomes this. Some people are more susceptible to static currents than others and to avoid the "shock" it is a good plan to have the patient hold an electrode in one hand. This can be easily led over to the radiator or some pipe. An electric push button in the other hand is a valuable asset as it is sometimes evident that the patient does feel something out of the ordinary and, being afraid to move, finds it hard to be heard above the whirr of the machine. The attention of the operator is called immediately by the push button the machine stopped and the trouble located.

Second, Protection of the nurse and the operator. No one has a right to stand within a distance of at least 10 feet from the tube and even then one should be behind lead screens, for the secondary rays fitting across the room and rebounding are bound to strike the unpro-

tected in their way. The rays received today and tomorrow may do no noticeable harm, but the rays of a series of todays and tomorrows may prove to be disastrous in the end. The new laboratories are nearly all equipped with separate operating booths, which are lead lined; here there is almost no danger from the tube.

Reassurance of a patient is a great feature in this work, for patients by the time they reach the x-ray stage, have probably tried everything else and have come to the röntgenologist with anything but an optimistic spirit. They are usually a little skeptical and a little more afraid and this is a place where mind over matter is almost an essential. The patient must expect a little nausea, a little "feeling," a question always asked by a new patient. He must be taught to fear neither noise of the machine nor the bright light. X-ray must mean nothing to the patient but improvement. Never tell a patient he will be cured; he may not be. Many times a patient will want the nurse to stay in the room while the treatment is going on. This is forbidden of course, but it will take a lot of explanation to make the patient believe it, and here is where a nurse must bend from her regular routine and tell the whys and wherefores. Reassurance is the main thing, and a mightily good thing for the progress of the treatment.

Another feature of a well-run laboratory is to have all machines in first class condition as to cleanliness and oil, so that there can be no possible chance for a "hitch" in a treatment. Flexibility of tube-stand, shift positions well oiled, good locking devices and focusing ability are all valuable points to remember.

Many nurses are groping about, wildly seeking the thing they want to do but knowing it not, and in the meantime doing private work or institutional work until "something turns up." There are a great many fitted for just this sort of work and are making good at it. To them all respect, but our reference is to those nurses who want to do something else but can't decide just what they want to do and so are "waiting." How many nurses are specializing in a particular branch? More doctors each year are giving up general practice and entering upon some specialty, and how much more efficient they become! Why not so with the nurse? If a nurse wishes to do private duty nursing, why not specialize in one branch, such as medicine, surgery, obstetrics, thereby making herself so efficient that people will not want anyone else but her, because she has had special training along that line. No person can do all things well. The motto should be, "All things in moderation and one thing in perfection." Some might say nursing is one thing, so is the medical profession; if a doctor finds it necessary to specialize, why is it not necessary for his assistant to do the same

thing? Some nurses lean toward pathology, why not take a pathological course and enter upon it as a specialty? Do the thing you like to do and do it well. Don't waste your time doing a lot of things you are not interested in, because you are waiting for something to turn up.

As to the x-ray, I would urge more nurses to take up this special line. A great many women are in x-ray laboratories throughout the country and very efficient they are, too. Many become expert technicians, having served their day as office girls or stenographers. To them is due all credit; but how much more valuable would be a trained assistant, one who has had lectures in anatomy and physiology, osteology, medicine, etc. Patients need nurses, doctors need assistants in röntgenological laboratories as well as they do in hospitals. There is a vast field of opportunity for the nurse who specializes in x-ray work.

Röntgenology is comparatively new, it is interesting, it is already indispensable in the medical and surgical world. Its possibilities and a nurse's acquirements are still at "X."

THE INTERSTATE SECRETARY

Adda Eldredge, who has recently been appointed interstate secretary, is well known to the members of the American Nurses' Association as she is serving now, for the fifth time, as first vice president. Miss Eldredge is a western woman, a graduate of St. Luke's, Chicago, where she was instructor of nurses for six or seven years. She was active in the first efforts made by the nurses of Illinois for securing registration. She is familiar with the work of the League, she has always been actively interested in the JOURNAL, and is familiar with the details of the plan for reorganization of our associations. Miss Eldredge's headquarters are to be in the editorial office of the JOURNAL in Rochester, where all correspondence concerning her trips can be conducted by her, or for her, in her absence.

While it is desirable that Miss Eldredge should be present, when possible, at state meetings, perhaps her most effective work will be in meeting with nurses in smaller groups, local League meetings, alumnae and city associations, and most important of all, groups of pupil nurses, especially seniors.